

**PATENT APPLICATION**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Yasushi YAMAZAKI, Takaaki TANAKA

Application No.: New US Patent Application

Filed: February 14, 2002

Docket No.: 111935

For: ACTIVE-MATRIX LIQUID CRYSTAL DISPLAY WITH LINE/COLUMN  
INVERSION DRIVES, AND ELECTRONIC DEVICE THEREFOR

**PRELIMINARY AMENDMENT**

Director of the U.S. Patent and Trademark Office  
Washington, D. C. 20231

Sir:

Prior to initial examination, please amend the above-identified application as follows:

**IN THE CLAIMS:**

Please replace claims 5-9, 15, 18, 21, 22 and 26 as follows:

5. (Amended) An active-matrix liquid crystal display according to claim 3, wherein the orientation direction is slanted by an angle of about 45° against the alignment directions of the first and second groups of pixel electrodes.
6. (Amended) An active-matrix liquid crystal display according to claim 1, wherein a pre-tilt angle ranging from 3° to 30° is imparted to liquid-crystal molecules lying in proximity to the active matrix substrate.
7. (Amended) An active-matrix liquid crystal display according to claim 1, wherein a pre-tilt angle ranging from 3° to 30° is imparted to liquid-crystal molecules lying in proximity to the active matrix substrate by forming pillar structures that are made of an inorganic material and are slanted in a specific direction on the active matrix substrate.

8. (Amended) An active-matrix liquid crystal display according to claim 1, wherein a pre-tilt angle ranging from 3° to 30° is imparted to liquid-crystal molecules lying in proximity to the active matrix substrate by forming mixtures of first and second pillar structures that are made of an inorganic material and are respectively slanted in different directions in plan view on the active matrix substrate.

9. (Amended) An active-matrix liquid crystal display according to claim 1, wherein a planarization process is performed on prescribed regions for wiring signal lines driving the pixel electrodes and other regions for arranging the pixel electrodes on the active matrix substrate.

15. (Amended) An active-matrix liquid crystal display according to claim 10, wherein the electronic device is a projector using a light modulator for modulating light to be projected onto a screen.

18. (Amended) An active-matrix liquid crystal display according to claim 16, wherein the active matrix substrate fabricates a first group of pixel electrodes that are aligned in a prescribed direction and are supplied with picture signals of a first polarity, and a second group of pixel electrodes that are aligned to adjoin with the first group of pixel electrodes respectively and are supplied with picture signals of a second polarity.

21. (Amended) An active-matrix liquid crystal display according to claim 19, wherein the liquid-crystal molecules lying in proximity to the active matrix substrate are initially oriented in a specific direction (Ra) in the non-power mode in such a way that the long-axis directions thereof are made substantially parallel with alignment directions of the first and second groups of pixel electrodes on the active matrix substrate.

22. (Amended) An active-matrix liquid crystal display according to claim 19, wherein the liquid-crystal molecules lying in proximity to the active matrix substrate are initially oriented in a specific direction (Ra) in the non-power mode in such a way that the

long-axis directions thereof cross with alignment directions of the first and second groups of pixel electrodes on the active matrix substrate, and wherein other liquid-crystal molecules contained in the liquid crystal layer are twisted in such a way that the long-axis directions thereof extend from the active matrix substrate to the opposite substrate and lie across the first and second groups of pixel electrodes on the active matrix substrate in plan view.

26. (Amended) An active-matrix liquid crystal display according to claim 23, wherein the electronic device is a projector using a light modulator for modulating light to be projected onto a screen.

REMARKS

Claims 1-26 are pending. By this Preliminary Amendment, claims 5-9, 15, 18, 21, 22 and 26 are amended to eliminate multiple dependencies. Prompt and favorable consideration on the merits is respectfully requested.

The attached Appendix includes marked-up copies of each rewritten claim (37 C.F.R. §1.121(c)(1)(ii)).

Respectfully submitted,



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Attached: APPENDIX  
Date: February 14, 2002

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## APPENDIX

## Changes to Claims:

The following are marked-up versions of the amended claims:

5.     ~~(Amended)~~ An active-matrix liquid crystal display according to claim 3 ~~or 4~~, wherein the orientation direction is slanted by an angle of about 45° against the alignment directions of the first and second groups of pixel electrodes.
6.     ~~(Amended)~~ An active-matrix liquid crystal display according to claim 1 ~~any one of claims 1 to 4~~, wherein a pre-tilt angle ranging from 3° to 30° is imparted to liquid-crystal molecules lying in proximity to the active matrix substrate.
7.     ~~(Amended)~~ An active-matrix liquid crystal display according to claim 1 ~~any one of claims 1 to 4~~, wherein a pre-tilt angle ranging from 3° to 30° is imparted to liquid-crystal molecules lying in proximity to the active matrix substrate by forming pillar structures that are made of an inorganic material and are slanted in a specific direction on the active matrix substrate.
8.     ~~(Amended)~~ An active-matrix liquid crystal display according to claim 1 ~~any one of claims 1 to 4~~, wherein a pre-tilt angle ranging from 3° to 30° is imparted to liquid-crystal molecules lying in proximity to the active matrix substrate by forming mixtures of first and second pillar structures that are made of an inorganic material and are respectively slanted in different directions in plan view on the active matrix substrate.
9.     ~~(Amended)~~ An active-matrix liquid crystal display according to claim 1 ~~any one of claims 1 to 4~~, wherein a planarization process is performed on prescribed regions for wiring signal lines driving the pixel electrodes and other regions for arranging the pixel electrodes on the active matrix substrate.

15. (Amended) An active-matrix liquid crystal display according to claim 10~~any one of claims 10 to 14~~, wherein the electronic device is a projector using a light modulator for modulating light to be projected onto a screen.

18. (Amended) An active-matrix liquid crystal display according to claim 16~~or 17~~, wherein the active matrix substrate fabricates a first group of pixel electrodes that are aligned in a prescribed direction and are supplied with picture signals of a first polarity, and a second group of pixel electrodes that are aligned to adjoin with the first group of pixel electrodes respectively and are supplied with picture signals of a second polarity.

21. (Amended) An active-matrix liquid crystal display according to claim 19~~or 20~~, wherein the liquid-crystal molecules lying in proximity to the active matrix substrate are initially oriented in a specific direction (Ra) in the non-power mode in such a way that the long-axis directions thereof are made substantially parallel with alignment directions of the first and second groups of pixel electrodes on the active matrix substrate.

22. (Amended) An active-matrix liquid crystal display according to claim 19~~or 20~~, wherein the liquid-crystal molecules lying in proximity to the active matrix substrate are initially oriented in a specific direction (Ra) in the non-power mode in such a way that the long-axis directions thereof cross with alignment directions of the first and second groups of pixel electrodes on the active matrix substrate, and wherein other liquid-crystal molecules contained in the liquid crystal layer are twisted in such a way that the long-axis directions thereof extend from the active matrix substrate to the opposite substrate and lie across the first and second groups of pixel electrodes on the active matrix substrate in plan view.

26. (Amended) An active-matrix liquid crystal display according to claim 23~~any one of claims 23 to 25~~, wherein the electronic device is a projector using a light modulator for modulating light to be projected onto a screen.